IRONDALE GULCH
DRAFT WATER MANAGEMENT PLAN FOR
ROCKY MOUNTAIN ARSENAL NATIONAL WILDLIFE AREA

U.S. FISH AND WILDLIFE SERVICE

FEBRUARY 1993

This is a draft proposal by the U.S. Fish and Wildlife Service (Service) for alternative flood control measures on the Irondale Gulch watershed at Rocky Mountain Arsenal National Wildlife Area (Arsenal). This proposal was prepared with the assistance of the Service's Regional Hydrologist in response to a water management plan proposed by the Urban Drainage and Flood Control District (UDFCD). The objective of the Service plan is to preserve as much habitat for fish and wildlife as possible, while fulfilling the flood control requirements of the UDFCD plan. Another significant constraint to flood water management at the Arsenal is the concern for groundwater contamination and the effects of infiltration on the migration and containment of contaminants.

The Service evaluated several flood control options for Irondale Gulch, including 14 different existing basins for potential flood water storage and/or infiltration (map enclosed). Six of these were retained for further study after a preliminary impact analysis (Table 1). In addition, a water quality basin was added near the junction of Randolph Tributary and the Uvalda Interceptor to remove debris and contaminants from storm water entering the Arsenal. Because of groundwater concerns, infiltration was not considered a viable option north of Sixth Avenue.

Highlights of the Service plan are reducing proposed enlargement of Havana Ponds to protect sand sagebrush habitat and eliminating Upper Derby Lake as a flood storage basin to preserve future management options for this basin. The UDFCD proposed plan would increase the maximum capacity of Havana Ponds to 485 acre-feet and maintain Upper Derby Lake dry to provide up to an additional 478 acre-feet of storage. A new flood detention basin (330 acre-feet) would also be constructed in Section 3 at or near an existing railroad embankment. The Service plan would increase the maximum capacity of Havana Ponds to 323 acre-feet at 5254 feet elevation. Under the Service proposal, the lost capacity at Havana Ponds and Upper Derby Lake (640 acre-feet) would be offset by enlarging the railroad detention facility by 746 acre-feet to 1076 acre-feet and adding new facilities, if necessary to handle peak flood flows. A base flow channel from Lake Ladora to the railroad embankment could be clay-lined to prevent infiltration to groundwater. The Service also would consider the use of a buried pipeline to convey base flows off-Arsenal, if necessary, to minimize impacts to wildlife habitat, but only if such a hard connection did not compromise future water management options by subjecting the Arsenal to "calls" for water by senior water rights holders downstream on the South Platte.

Although Upper and Lower Derby Lakes, Lake Ladora, and Lake Mary are within the Irondale Gulch system, these would have no primary role in flood control, allowing the Service to continue managing these resources for fish and wildlife.

TABLE 1. IRONDALE GULCH WATER MANAGEMENT PLAN
EVALUATION OF ALTERNATIVES SUMMARY

FEATURE MAP#	LOCATION SECTION#	CAPACITY (ACRE-FEET)	STATUS	COMMENTS/*REASON FOR ELIMINATION
1	33	33	Retained	Reserved for major flow events
2	33	30	Retained	Reserved for major flow events
3	3	1076	Retained	Clay-lined base flow channel
4	3	162	Eliminated*	Impacts to woody vegetation
5	11	74	Eliminated*	Impacts to unique community
6	11	22	Retained	Primary storage/infiltration
7	11	323	Retained	Primary storage/infiltration
8	12	77	Retained	Reserved for major flow events
8+	12	340	Eliminated*	Impacts to woody vegetation
9	7	15	Eliminated*	Impacts of water delivery system
10	7	5	Eliminated*	Impacts of water delivery system
11	7	5	Eliminated*	Impacts of water delivery system
12	7	30	Eliminated*	Impacts of water delivery system
13	7	152	Eliminated*	Impacts of water delivery system
14	8	76	Eliminated*	Impacts of water delivery system
15	12	Unknown	Retained	Water quality basin; site, size, and configuration undetermined
U.DERBY	1	478	Eliminated*	Loss of water management options
L.DERBY	1	0	Retained	Retained for pass through only
L.LADORA	2	Unknown	Retained	Reserved for major flow events

The following narrative describes and evaluates these features in detail:

1. Basin 1 would be located at an existing berm in Section 33. Water would discharge into either the Irondale Containment System recharge wells or Commerce City storm system, or would be allowed to infiltrate and evaporate. Since this feature would not be expected to receive any base flows, and would only contain water during major flow events, no lining would be required. The low frequency and duration of inundation would cause no significant adverse impacts to existing grassland habitat.

2. This feature is very similar to the first, except that a surface discharge (drain) would be required to convey water downstream to Basin 1. Like Basin 1, no significant volume of base flow would reach this feature, and no lining would be required.

3. Railroad Detention Facility: This feature was carried over from the UDFCD proposal. Moreover, its capacity was enlarged from 330 acre-feet to 1076 acre-feet to offset the loss of flood storage capacity upstream. However, because the Service plan would provide additional infiltration compared to current conditions, little base flow is expected to reach this feature. A small area of the basin would be clay lined to prevent infiltration of base flows to groundwater and appropriate mitigation would be necessary to minimize and compensate for adverse impacts to grassland habitat.

4. This new feature is the one of three basins designed to replace flood storage capacity at Havana Ponds. However, because it is located directly above a contaminant plume, this basin would have to be lined to prevent infiltration, destroying a large area of woody vegetation. For this reason, this feature was eliminated from further study.

5. This and Basin 6 were designed as infiltration basins to replace the infiltration capacity lost due to downsizing Havana Ponds. To allow for infiltration, Basin 5 would not be lined but would contain water only during major flow events. Nevertheless, Basin 5 lies at the core of a prairie dog community, unique in that it is surrounded by trees, which also attract a variety of raptors. Prairie dogs are burrowing animals and require well-drained soils. Any inundation no matter how brief or infrequent would eliminate prairie dogs from this area. Therefore, Basin 5 was eliminated from further consideration.

6. Basin 6 is located immediately downstream from Havana Ponds and has been retained as a secondary infiltration basin. Nevertheless, Basin 6 would contain water almost continuously.

7. Havana Ponds: The Service's greatest concern with the UDFCD proposal for Havana Ponds was that it would inundate a valuable sand sagebrush community. Since the Service's proposal provides additional storage capacity downstream, Havana Ponds can be downsized to a lower elevation to protect the sand sagebrush community. To maximize flood storage capacity and provide water quality control for urban runoff, Havana Ponds would remain empty except during storm events in the watershed. Storm water would be allowed to evaporate and infiltrate.

Self-cleaning trash racks should be installed at the Havana Street interceptor and Peoria ditch to trap any floating debris; accumulated sediment should be tested periodically for contamination and removed, if necessary, by the City and County of Denver.

8. The Rod and Gun Club Pond was evaluated as a potential water quality treatment site. Additional flood storage capacity also was considered by expanding the basin west to D Street (8+). This expansion would inundate a large area of woody vegetation used extensively by deer. Therefore 8+ was eliminated from further consideration. Furthermore, the Rod and Gun Club wetland is considered too valuable and too interior to the Arsenal to be sacrificed for water quality. Nevertheless, this basin has been retained as a secondary receptacle for flood water if other flood storage facilities reach their maximum capacity. Water could be delivered to the Rod and Gun Club through a ditch or pipeline from the Uvalda Interceptor.

9. This new feature would be used only during major flow events, or it could be developed as part of a wetland complex in Section 7. However, the potential impacts of constructing water delivery systems outweigh any benefits expected to accrue from its construction. Therefore, it was eliminated.

10 - 14. These existing created wetlands could be expanded to store peak flood flows. Outside these infrequent events, the wetlands would be operated under present protocols with water from the Highline Canal. As with Basin 9, however, the impacts of developing a new water delivery system were considered unacceptably high; therefore, these basins were eliminated from the plan.

15. The precise location, size, and configuration of this feature have not been determined. This basin is designed to prevent debris and contaminants originating upstream in the watershed from penetrating the interior of the Arsenal. Self-cleaning trash racks should be installed at each inlet to the basin to trap any floating debris, and accumulated sediment should be tested periodically for contamination and removed, if necessary, by the City and County of Denver. The location currently under consideration for this water quality basin is near the junction of the Randolph Tributary and Uvalda Interceptor in the south-central area of Section 12. Its general location does not coincide with any natural basin; therefore, extensive excavation would be required to achieve the desired water quality benefits. However, material removed from this site could be used as borrow material for contaminant remediation activities.

Upper Derby Lake: The UDFCD proposal called for Upper Derby Lake to remain empty to provide maximum flood storage capacity. This would preclude any future management of this resource for fish and wildlife, and could jeopardize an existing water right. The Service's proposal would retain the option to manage Upper Derby Lake for wildlife after contaminated sediments have been remediated.

Lower Derby Lake: Operation of Lower Derby Lake would remain unchanged. Base flows would be subject only to evaporation and infiltration losses, while flood flows would continue to pass through to Lake Ladora without retention in Lower Derby.

Lake Ladora: Due to dam safety and contaminant considerations, there currently is no flood storage capacity in Lake Ladora. To rectify the safety problem, the Ladora Dam will be rehabilitated in the near future. The new dam is expected to increase the maximum safe storage capacity of the lake, a portion of which could be reserved for future flood storage. However, the South Tank Farm Plume Interim Response Action requires that the water surface of Lake Ladora be maintained at no less than 5220 feet elevation. Consistent with this requirement, the Service proposes to continue managing the lake at this level with any unused safe storage capacity reserved for secondary, short-term flood storage. That is, Lake Ladora would be used for flood storage only after primary flood storage, infiltration and conveyance facilities reach their maximum capacities.

This plan is conceptual in nature and does not prescribe specific design criteria for these features. Also, it does not address specific "maintenance" activities on existing ditches, interceptors, and conveyance channels, or the proposed construction of new channels for flood water conveyance. Any loss or degradation of fish and wildlife habitat or direct disturbance of wildlife must be mitigated. The Service reserves the opportunity to review these and related actions on a site-specific basis to evaluate their potential impacts on fish and wildlife resources and prescribe certain mitigation measures to avoid, minimize, or compensate for any adverse impacts.

ROCKY MOUNTAIN ARSENAL
ALTERNATIVE STORAGE AT FOR STORM RUNOFF
REGION SIX, WATER RESOURCES DIVISION
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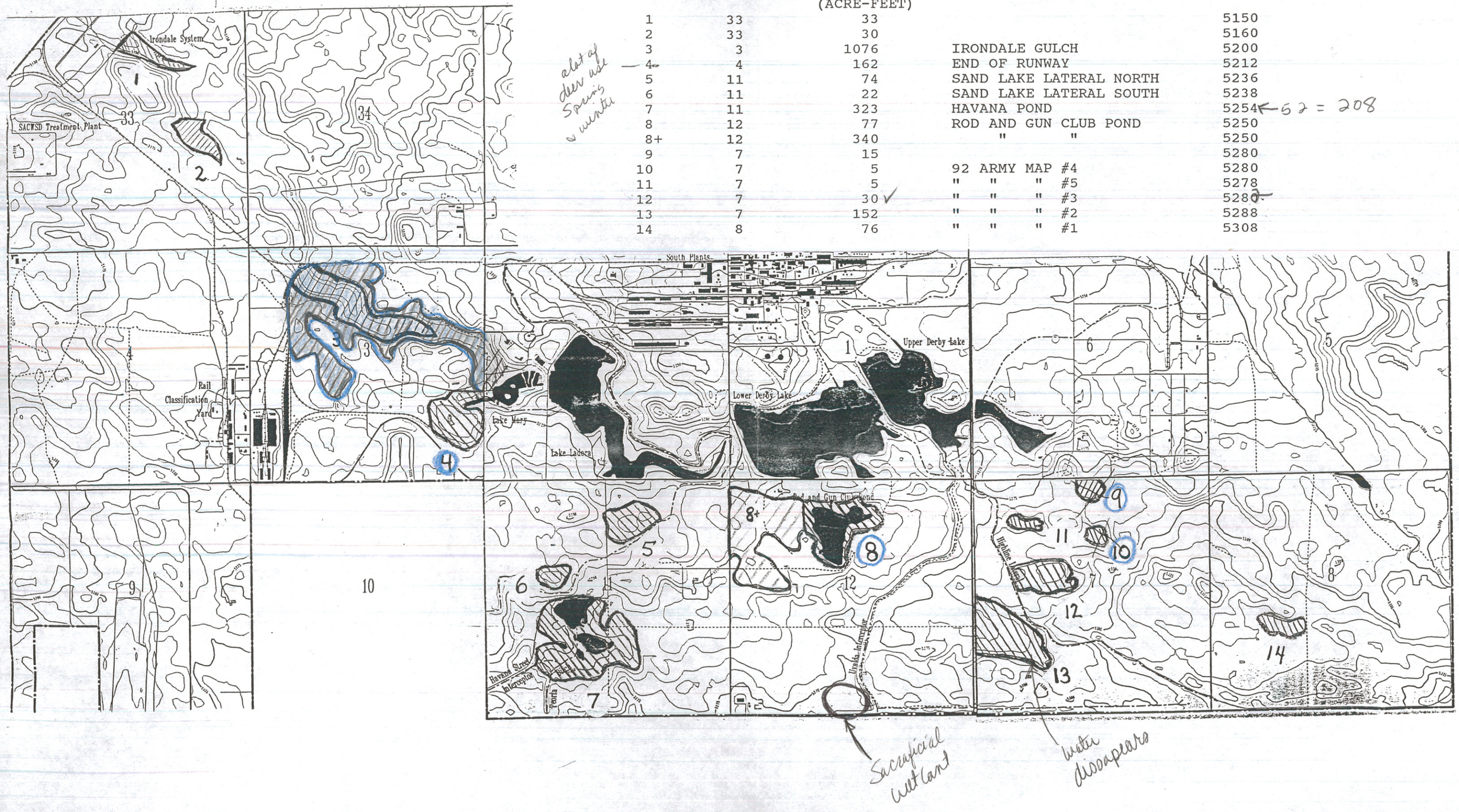
	SECTION #	CAPACITY (ACRE-FEET)		MAXIMUM ELEVATION
1	33	33		5150
2	33	30		5160
3	3	1076	IRONDALE GULCH	5200
4	4	162	END OF RUNWAY	5212
5	11	74	SAND LAKE LATERAL NORTH	5236
6	11	22	SAND LAKE LATERAL SOUTH	5238
7	11	323	HAVANA POND	5254 ← 52 = 208
8	12	77	ROD AND GUN CLUB POND	5250
8+	12	340	" "	5250
9	7	15		5280
10	7	5	92 ARMY MAP #4	5280
11	7	5	" " " #5	5278
12	7	30 ✓	" " " #3	5280 ?
13	7	152	" " " #2	5288
14	8	76	" " " #1	5308

alot of deer use Spring & winter



Sacrificial wetland

water disappears

CANAL
2300 ft

2960 ft
Dike

pool # 8 from Uvalda to larger of two ponds 11.53 inches x 200 ft =
round to 5250 for dike = (14.8 inches x 200) =

PRIMARY FLOOD STORAGE AND INFILTRATION

SECONDARY FLOOD STORAGE AND INFILTRATION

NO FLOOD STORAGE CAPACITY

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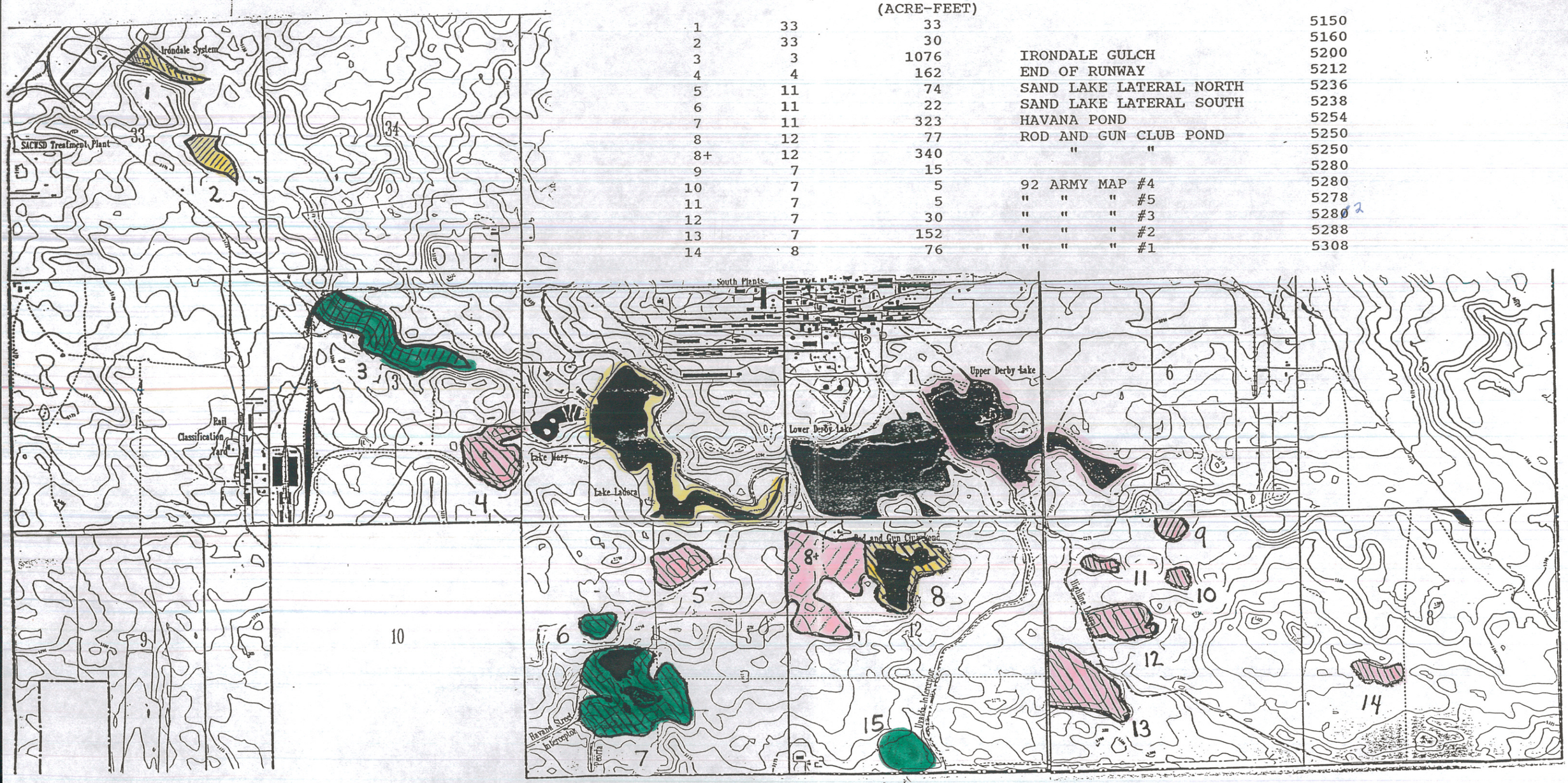

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